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**FEYERABEND'S VIEWS ON SCIENTIFIC CONSTRUCTIONS AND THE CRITERIA
 FOR THEORY- CHOICE**

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1. Introduction

Paul Feyerabend (1924-1994) in his book *Conquest of Abundance* states that “humans as sculptors of reality” (p.144) explicitly “scientists are sculptors of reality” (p.144). In a sense, our ways of thinking, beliefs, and attitudes are the results of idiosyncratic historical developments. However, it does not indicate that we create reality from nowhere, the term ‘sculptors’ signifies a special sense here. He states that reality was manufactured not given. Scientists are complex embedded beings. They use ideas and actions to manufacture, which involved, for instance, CERN (European Council for Nuclear Research), and they tried to make an equilibrium between their projections with what it posits. The representation of reality is tied to its stage action and reality is part of that stage action (customs, beliefs, and economic relation institutions are elements of the stage). So, nature is transformed through various complex and sophisticated processes. By understanding Nature, we transform it. Different stages or traditions project different aspects of reality, and there are different ways of appealing to the world. “There are many different maps of reality, from a variety of scientific viewpoints” (1999:154). The world is not directly given to us it comes through various complex processes. “Our world has been transformed by the material, spiritual and intellectual impact of science and science-based technologies” (1999:145). The consequences are the result of the mutual interplay between unknown reality and researchers who transform and affect by those materials. Since, the subjective side of knowledge, is inextricably intertwined with its material manifestations, it cannot be simply dismissed.

So, human intervention is always there but it is implausible to claim that, such projections (stories, pictures, perceptions, and theories) identify with stage-independent reality. For him, the ultimate reality or being is ineffable and cannot be known. So, he denies the accessibility of that reality. At this point, He distinguishes between ‘Being’ and ‘Manifest realities.’ And claims that our known worlds or manifest realities or constructions are the results of how being responds to those conditions or practices. None of the manifest reality even though sciences, does not disclose ultimate realities. “Science knows no bare facts”. He questioned, “How can information that is the result of idiosyncratic historical changes be about history-independent facts and laws?” (1999:131). Scientists use multi-

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

scientific approaches and approach the world in very different ways, So, different theories curved up and structure reality in a very different way.

Feyerabend talks about the theory-ladenness of observation. He states “The interpretation of an observation language is determined by the theories which we use to explain what we observe, and it changes as soon as those theories change (1981b:31). So, he questions the neutrality of observations. Since the same set of data can be differently interpreted by competing theories. The reason behind not considering fact as a criterion or standard for theory appraisal is that He believes that theory itself modifies fact in a certain way, with no clear line that can be drawn between them, which clearly points that, why Feyerabend did not believe in their infallibility.

Another reason for not considering the naïve version of theory appraisal is that Feyerabend states, numerical disagreements between fact and theory in his book *Against Method*. He has said that each theory surrounds an ocean of anomalies, where the predicted value differs from the actual value by larger margins of error. Because no theory ever agrees with all the facts in its domain. “There exist numerous discrepancies between observation and theory” (1975:40). We assume that the sensory information which we received through the experiment is accurate and veridical and that the material medium between the object and us does not contain any distortion, which is not the case. Events cannot be understood independently of procedure, social circumstances, accidents, and personal idiosyncrasies involved in particular research situations. He adds “Evidence is contaminated” (1975:22). In this context he debunks the positivists’ frozen image of science that it only deals with facts and draws conclusions from it. So experimental results cannot be taken as measured to the success of a theory. If we analyze the history of science it will be seen that it is full of chaos and complex process. He was critical of the traditional image that, science is purely objective and rational.

Now I move into his notion of incommensurability of theories in the next section, which creates difficulties in regard to the theory appraisal process.

2. Incommensurability of theories

Feyerabend advocated an incommensurability thesis to emphasize the relationship between successful scientific theories and the practices of different communities of scientists. Incommensurability is an epistemological issue, which arises in the case of successive scientific theories in the philosophy of science. This can be formulated as ‘having no common measurable’. Feyerabend in his paper, *Explanation Reduction and Empiricism* emphasized the notion of incommensurability. There are different accounts of incommensurability thesis, out of which, two

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

dominant versions, i.e., semantic and methodological incommensurability are often discussed. Incommensurability is discussed in the sense of meaning change and in the sense of change of problems and standards.

Semantic incommensurability shows that Rival scientific theories are incommensurable due to the meaning variance of the terms they employed. Feyerabend calls into question the 'meaning invariance' principle which exemplifies the invariant meaning in theory change. Feyerabend claimed that the Meaning of the terms depends on the theoretical context in which it has occurred. He shows several examples where the previous conception of an object changed next to alternative theories. Feyerabend states that in pre-relativistic physics mass is conceived as absolute whereas in relativistic physics the concept of mass is thought of as relational property "in the pre-relativistic physics we are measuring an intrinsic property of the system under consideration, whereas in the relativistic physics, we are measuring a relation between the system and certain characteristics of a domain' (1981a: 81-82) Howard Sankey clearly formulated the semantic Incommensurability thesis in this way: Two competing scientific theories are incommensurable if and only if (i) the meaning of the vocabulary by theories varies between theories(ii) translation is impossible from the vocabulary of one theory into the vocabulary of the other (iii)as a result of (i) and (ii), the content of such theories may not be compared (Sankey,1997: 428).

Though they use the same term, they refer readily to two different things. Their term is relative to their theory or we may say the taxonomic structure of a theory. Actually, Feyerabend talks about the holistic theory of meaning. That's why Feyerabend claimed, derivation or reduction between two systems is not possible. This 'meaning variance' leads to scientific theories being incommensurable and the content of such theories cannot be compared. For Feyerabend meaning change implies both in sense and reference, The competing theories fail to co-refer the same reference. Such changes in meaning lead to the situation that scientists find it very difficult to compare competing theories There is no neutral observation language through which a decision can be made. This makes a rational adjudication between two competing theories challenging. His incommensurability does undermine the possibility of comparing competing theories due to semantic variance.

On the other hand, methodological incommensurability indicates rival theories are incommensurable due to a lack of common standards of theory appraisal. This study rejects the traditional ways of doing science that there is a uniform, fixed scientific method that acclaimed the objectivity of scientific theories. The debate over the choice of theory continues among scientists. Because of that, the superiority of one theory over another cannot be proved in debate. He claimed

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

there is no objective ground for the choice of competing theories. Feyerabend denied any neutral algorithm for theory choice. Feyerabend rejects the 'positivists' idea of a neutral observation language, which determines which theory must prevail. So, if there is no neutral objective way to compare theories then it is impossible to say that one theory is more truth-like or has higher verisimilitude. He states, there is no shared nomenclature that allows direct comparison of theories to determine which theory is more valid. It is impossible to compare the truth content of theories. Feyerabend said "comparison by content, or verisimilitude was of course out" (1978: 68) Feyerabend states that due to semantic variance of terms between rival theories, the lack of logical relations, as a result, inability to compare the content of theories (Feyerabend,1962b: 68-94).

Feyerabend's methodological and semantic incommensurability is considered a yardstick that demonstrates the objectivity of scientific theories as a myth. So, the non-existence of bare facts and incommensurability thesis raises questions regarding the rational comparison of competing theories. Through his incommensurability thesis I have shown how theories differ from one another, and also shown their rational comparison cannot be made according to the positivist lane. Now it is important to note what are the relevant criteria which scientists mostly follow in regard to theory choice and Feyerabend's perspective on this.

3. Criteria for theory choice

Feyerabend talks about the theory-ladenness of observation and that's why he rejects the correspondence theory of truth because he believed that, there is a theory independent or neutral objective reality, based on which we can judge our theories. So, his incommensurability leads to the question regarding the possibility and method of the choice between competing theories. In his book *Science in a Free Society*, Feyerabend mentions that the decision between competing theories cannot be resolved by content. So, the debate over the choice of theory continues among scientists. And this turns theory choice irrational and subjective. If any theory is as good as any other, are we in a position to compare them? Suppose one theory is good in simplicity another is good in consistency, So what's more important simplicity or consistency? Often these important decisions are made by the scientific community, explicitly by experts who are in the dominant regime. But experts too are humans so subjective elements are inescapable to remove. If there is no neutral objective way to compare theories then it is impossible to say one theory is more truth-like or has higher verisimilitude. There is no shared nomenclature that allows direct comparison to determine which theory is more valid. The incommensurability thesis raises questions regarding the rational comparison of competing theories. Though he tried to find wish-independent criteria for theory evaluation because of incommensurability

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

he claimed that “content of comparison of course out, the comparison cannot be made with content or truth except rhetorically” (1978:146). So, this turns theory choice irrational and subjective. Because techniques of persuasion often play a role in determining which theory will prevail.

Feyerabend claims that the choices which scientists make in competing theories do not depend solely on the shared criteria, which also depend on an idiosyncrasy of an individual, personality, and biography. Here subjectivity comes. There is something ineradicably subjective in science. Subjective elements are inescapable to remove. So, by using the nonexistence of ‘bare’ facts and the incommensurability thesis, he concludes that scientific theories triumph in a wholly irrational way. The choice or decision between competing theories is not grounded in rationality. He states in regard to scientific practice unreason cannot be excluded.

Conflicting diabetes arises in science regarding matter and application, and, unanimity, as Feyerabend said, is the result of a political decision. Feyerabend assumes that “like many far reaching decisions, both in the sciences and elsewhere, this was done partly on political grounds. Power (over minds and institutions) played as important a role then, in science as well as in religion” (2011:51). Feyerabend takes non-rational factors such as historical context as well as human factors or idiosyncrasies into account. Feyerabend goes further by saying that “the scientific decision-making, as revealed by the historical record, is a political and propagandistic affair in which prestige, power, age, and polemic determine the outcome of the constant struggle between competing theories” (1979: 535). However, we should note that He is not in favour of philosophical relativism which claims that all construction is equally good. Some constructions are appealing, revealing, and interesting characters. He recognizes several conditions or values for good constructions like comprehensibility, simplicity, and fruitfulness. However, it is important to note that, these conditions or values do not imply that, one theory is objectively better or worse than another. These values are not objective, therefore, under attack, because these values may apply differently, individually and collectively by the scientific community. These criteria may vary from individual to individual as this includes subjective interpretation. Moreover, these values, applying them to a given case is very hard, on the other hand, these criteria may conflict with one another. As Max Weber notes “Values are not properties inherent to objects themselves, but rather based on subjective interpretation by us humans” (2014: 37). He sums up “Non-scientific procedures cannot be pushed aside by argument” (1975:2). As Feyerabend notes social atmosphere, economics, Interest, forces, propaganda, and brainwashing techniques play a much greater role than is commonly believed, all have influence.

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

From the above discussion, we cannot assume that incommensurable theories make the world whatever way we want. He implies that “not all approaches to reality are successful. Reality must react in a positive way” (1999:215). Different approaches are constrained by resistance. Feyerabend's construction implies that theories co-constitute the phenomena we observed or experience. Each tells different stories, which give information about the world, and our desire for those stories leads to epistemic progress. However, it is important to note that, Feyerabend is not saying that every construction leads to a well-articulated liveable world. They got resistance that's why some construction collapsed. Sculptors are restricted by the material. Its material exists independently of observation and the arrangement depended heavily on human experiences. Feyerabend states that reality is pliable, it be moulded by epistemic ways in an indefinite number of ways, each of which answers particular questions we are asking nature. But this pliability is limited by resistance “Some constructions find no point of attack...simply collapse” (1999:145).

Since no theory ever agrees with all facts. No theory is as good as any other. Each theory faces difficulty. He advised we should proceed research counter-inductively. He claimed theory proliferation is needed “invent and elaborate theories which are inconsistent with the accepted point of view, even if the latter happen to be highly confirmed and generally accepted” (26). In regard to scientific practice; the availability of theoretical alternatives is needed. Scientists must embrace a pluralistic approach, compare ideas with other ideas, and work to improve unsuccessful views rather than discard them in order to maximize the empirical substance of a perspective. This pluralistic view is vital for the identification of inconsistencies and disputes of highly confirmed theories. The decisive character of the previous theory is established through alternative factually adequate theories. Sometimes it is impossible to detect anomalies within a conventional scientific framework, these anomalies occasionally only be revealed from the perspective of an alternative theory. Without going into too much detail we should note that his main intention to suggest the principle of proliferation is that, no theory can claim to be as close to the truth because he believed that no theory is perfect as any other. Each theory has a problematic aspect and surrounds an ocean of anomalies. For this reason, non-epistemic factors influence the determination of the outcome of the competing theories.

John Preston (1997) argues that Feyerabend's takes an idealistic position, the reason behind this claim is that Feyerabend in his book ‘Science in a Free Society’ states that:

we certainly cannot assume that two incommensurable theories deal with one and the same objective state of affairs...Hence, unless we want to assume that they deal with nothing at all we must admit that they deal with different worlds and that the change (from one world to another) has been brought about

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

by a switch from one theory to another...Speaking in this manner we no longer assume an objective world that remains unaffected by our epistemic activities ...we concede that our epistemic activities may have a decisive influence even upon the most solid piece of cosmological furniture -they may make gods disappear and replace them by heaps of atoms in empty space”(1978:70).

The above assertion considered Feyerabend an idealist, as Preston states. But we must disagree with John Preston’s claim here because Feyerabend returned to realism, his philosophical positions were changed over time which we clearly find in his later philosophy, which Preston ignores in his analysis. We can see Feyerabend's response in this way:

I do not assert that any combined causal-semantic action will lead to a well-articulated and livable world. The material humans...face must be approached in the right way. It offers resistance; some constructions ...find no point of attack in it and simply collapse. On the other hand, this material is more pliable than is commonly assured. Moulding it in one way ...we get elementary particles; proceeding in another, we get a nature that is alive and full of gods (Feyerabend,1989: 405).

Here we cannot ignore the phrase ‘offers resistance’ and reality is ‘more pliable than commonly assumed’. Feyerabend is not claiming that all constructions are as good as any other or that we make the world whatever way we want. That’s why he claimed ‘some construction find no point of attack simply collapses’. When we consider his ‘resistance’ and ‘pliability’ thesis we must conclude that Feyerabend's theories are not wholly idealistic. When Reality offers resistance and unambiguously rejects and says no to some constructions then reality is in some way independent of constructions. So Feyerabend cannot be accused of idealism. Though he admits that human intervention is always there. and cannot be blown away. So, for him “‘reality’ is a conditional reality: conditional upon the coordinated social efforts of determined people, and upon the objective, independent constraints of reality (2001:365).

4. Conclusion

In this paper, we have shown how non-scientific factors include in the theory construction process, in this regard, we also mention his incommensurability theories which create difficulties in cases of theory choice. Through his resistance thesis, we have shown that his philosophical position cannot be asserted as an idealistic approach which many philosophers claim. If we analyze Feyerabend’s philosophy then it will be seen that he emphasized science in a socio-cultural background. He was not just concerned with epistemic factors, but also the non-epistemic factors involved in the knowledge construction process, that’s why he takes scientific results, and methods into account. He was considered ‘science's worst enemy’ by the scientific community. However, we

SKBU JOURNAL OF PHILOSOPHY**PEER REVIEWED**

should note that Feyerabend is not claiming that science is entirely subjective or irrational. He believed that science make progress. He simply highlights the points, where his view of science sharply diverges from the traditional ways. Feyerabend's critical attitude towards scientific practice changed the way how science was thought. His thought has been a great contribution to the research tradition of the philosophy of science.

They believe that science is an objective enterprise concerning theory choice. Feyerabend maintains the view that external factors also have some influence. Feyerabend's inquiries about the importance and the role played by the scientific community and tradition in the epistemic cognitive process. It is through a certain dynamic interaction between the values and subjective and historical conditions that science takes its turn toward progress.

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SKBU JOURNAL OF PHILOSOPHY

PEER REVIEWED

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